Unit 10
Day 5
Absolute Value Equations
Section 2.8 of the textbook.

Definition of Absolute Value

$$|a| = \begin{cases} a & \text{if } a \geq 0 \\ -a & \text{if } a < 0 \end{cases}$$

1) $|2x - 7| = 9$

$2x - 7 = 9$ OR $2x - 7 = -9$

$2x = 16$ $\quad$ $2x = -2$

$x = 8$ $\quad$ $x = -1$

$\{-1, 8\}$

2) $3|x+3|+12=6$

$\frac{3|x+3|}{3} = \frac{-6}{3}$

$|x+3| = -2$

$\emptyset$

$3|x+3|+12=6$

$3y+12=6$

3) $\left|\frac{2x-1}{x+3}\right| = 1$

$\frac{2x-1}{x+3} = 1$ OR $\frac{2x-1}{x+3} = -1$

$2x-1 = x+3$

$x = 4$

$2x-1 = -x-3$

$3x = -2$

$x = -\frac{2}{3}$

$\left\{4, -\frac{2}{3}\right\}$

4) $|x+6| = 3x-2$

$x+6 = 3x-2$ or $x+6 = -3x+2$

$-2x = -8$ $\quad 4x = -4$

$x = 4$ $\quad x = -1$

$\{4\}$ $\quad \{4, -1\}$

5) $|5x+2| = |3x-6|$

$5x+2 = 3x-6$ or $5x+2 = -3x+6$

$2x = -8$

$x = -4$

$8x = 4$

$x = \frac{1}{2}$

$\{-4, \frac{1}{2}\}$

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